

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A semiconductor device comprising:  
a wide-gap bipolar semiconductor element using a wide-gap semiconductor having stacking faults including basal plane dislocation, and having a built-in voltage in the forward direction[[],];  
a semiconductor package accommodating said wide-gap bipolar semiconductor element and having electrical connection means for connecting said wide-gap bipolar semiconductor element to external apparatuses, ~~and;~~  
~~means for heating~~ a heater which is provided to the package and heats said wide-gap bipolar semiconductor element inside said semiconductor package at to a temperature of 125°C 50°C or more;  
a temperature sensor which is provided to the package and detects the temperature of said wide-gap bipolar semiconductor element; and  
a temperature controller which controls the heater on the basis of a detection output of said temperature sensor so as to heat said wide-gap bipolar semiconductor element to a temperature of 50°C or more and less than 200°C before energization of said wide-gap bipolar semiconductor element, and then starts the energization of said wide-gap bipolar semiconductor element, raising the temperature of said wide-gap bipolar semiconductor element to 200°C or more by self-heating of said wide-gap bipolar semiconductor element.

2-6. (Canceled.)

7. (Currently Amended) A semiconductor device in accordance with claim 1, wherein said ~~means for heating~~ heater is an electric heater ~~providing heat to said wide-gap bipolar semiconductor element.~~

8-10. (Canceled.)

11. (Previously Presented) A semiconductor device in accordance with claim 1, wherein said wide-gap bipolar semiconductor element is either a diode having a pn junction or a self-excited thyristor.

12-17. (Canceled.)

18. (Currently Amended) A semiconductor device comprising:  
a wide-gap bipolar semiconductor element using a wide-gap semiconductor having stacking faults including basal plane dislocation, and having a built-in voltage in the forward direction[[,]];

a semiconductor package accommodating said wide-gap bipolar semiconductor element and having electrical connection means for connecting said wide-gap bipolar semiconductor element to external apparatuses[[,]];

means for heating a heat sink which is provided to the package and controls a radiation of heat generated when the said wide-gap bipolar semiconductor element is energized so as to keep said wide-gap bipolar semiconductor element inside said semiconductor package at a temperature of  $\pm 25^{\circ}\text{C}$   $\pm 50^{\circ}\text{C}$  or more[[,]];

a temperature sensor for detecting which is provided to the package and detects the temperature of said wide-gap bipolar semiconductor element[[,]]; and

a temperature controller that keeps the temperature of said wide-gap bipolar semiconductor element at the temperature of  $\pm 25^{\circ}\text{C}$   $\pm 50^{\circ}\text{C}$  or more and less than  $200^{\circ}\text{C}$  on the basis of a detection output of said temperature sensor by energizing said wide-gap bipolar semiconductor element with an applied current smaller than a rated current so as to generate self-heating of said wide-gap bipolar semiconductor element under control of a radiation of heat from said wide-gap bipolar semiconductor element by the heat sink, and then allows said wide-gap bipolar semiconductor element to be applied with a current up to the rated current so as to raise the temperature of said wide-gap bipolar semiconductor element to  $200^{\circ}\text{C}$  or more by self-heating of said wide-gap bipolar semiconductor element.

19. (Previously Presented) A semiconductor device in accordance with claim 1, wherein the semiconductor package comprises a support made of metal, on which the wide-gap bipolar semiconductor element is mounted.

20. (Previously Presented) A semiconductor device in accordance with claim 19, wherein the semiconductor package comprises a cap made of metal fixed on the support so as to cover the wide-gap bipolar semiconductor element.

21. (Currently Amended) A semiconductor device in accordance with claim 19, wherein the wide-gap bipolar semiconductor element is bonded to a upper face of the support, and

the ~~means for heating~~ heater is located on a lower face of the support.

22. (Currently Amended) A semiconductor device in accordance with claim 19, wherein the wide-gap bipolar semiconductor element is mounted via an insulation plate on the support, and

the ~~means for heating~~ heater is located on a lower face of the support.

23-29. (Canceled.)

30. (Previously Presented) A semiconductor device in accordance with claim 1, wherein the semiconductor package comprises a molded heat-resistant resin so as to encapsulate the wide-gap bipolar semiconductor element.